CLAIMS

1. Process for the arc welding of at least one metal workpiece (1) to a matrix (2) comprising at least one brazed zone (3), the braze of which contains copper and phosphorus, in which:

(a) at least one layer (5, 6, 7) of an alloy containing copper and more than 1% tin by weight is deposited on at least part of the brazed zone (3); and

(b) the metal workpiece (1) is welded to the said at least one layer (5, 6, 7) of copper/tin alloy deposited in step (a).

2. Process according to Claim 1, characterized in that the copper/tin alloy contains at least 1.05% tin, preferably at least 1.2% tin and/or the copper/tin alloy contains less than 10% tin.

3. Process according to either of Claims 1 and 2, characterized in that the copper/tin alloy contains at least 80% copper, preferably at least 90% copper, by weight.

4. Process according to one of Claims 1 to 3, characterized in that the copper/tin alloy contains less than 1% phosphorus by weight.

5. Process according to one of Claims 1 to 4, characterized in that the copper/tin alloy contains from 2% to 8% tin, preferably around 3 to 6% tin, by weight.

6. Process according to one of Claims 1 to 5, characterized in that, in step (a), several layers (5, 6, 7) based on a copper/tin alloy are deposited, these being at least partly superposed one with respect to another.

7. Process according to one of Claims 1 to 6, characterized in that the deposition of at least one layer (5, 6, 7) of copper/tin alloy of step (a) is carried out by (i) locally preheating the alloy zone to be coated and (ii) supplying and depositing, in the zone preheated in step (i) the copper/tin alloy melted by an electric arc.

8. Process according to Claim 7, characterized in that the preheating of step (i) is carried out by using one or more electric arcs, preferably at least one arc generated by a TIG or plasma welding torch.

9. Process according to Claim 7, characterized in that, in step (ii), the alloy is supplied in the form of a wire of copper/tin alloy.

10. Process according to either of Claims 7 and 9, characterized in that, in step (ii), the electric arc for melting the meltable wire is generated by at least one MIG or TIG welding torch.

11. Process according to one of Claims 1 to 10, characterized in that the said at least one layer (5, 6, 7) of copper/tin alloy deposited in step (a) has a phosphorus solubility limit of between about 0.1 and 3.5% at the solidification temperature.

12. Process according to one of Claims 1 to 11, characterized in that the brazed (3) matrix (2) is supported by a stack of several plates (11) separated by fins (12) forming spacers between the said plates (11), the said fins (12) and the said plates (11) being brazed to one another so as to form the said brazed (3) matrix (2) and/or in that the workpiece (1) is a component of a fluid collecting and/or distributing container forming part of a heat exchanger, the said workpiece (1) preferably being made of copper or stainless steel.

13. Process for manufacturing a brazed copper heat exchanger, in which the welding process according to one of Claims 1 to 12 is used to weld at least one fluid collecting and distributing container (1), preferably made of copper, of the exchanger (10) to a stack of plates (11) separated by fins (12) forming spacers between the said plates (11) and supporting at least one brazed (3) matrix (2).

14. Copper heat exchanger (10) comprising at least one fluid collecting and distributing container (1) welded (at 4) to a brazed (3) matrix (2) supported by a stack of several plates (11) separated by fins (12) forming spacers between the said plates (11), characterized in that the said container (1) is welded to at least one layer (5, 6, 7) of an alloy containing copper and more than 1% tin by weight, the said at least one copper/tin layer (5, 6, 7) being deposited on the said brazed (3) matrix (2).

15. Exchanger according to Claim 14, characterized in that the fluid collecting and distributing container (1), welded at 4, is made of copper or stainless steel.

16. Plant for separating fluids, particularly gas mixtures, comprising at least one exchanger (10) according to either of Claims 14 and 15, preferably the said plant being a cryogenic air separation unit.

17. Process for separating fluids, particularly gas mixtures, in which at least one heat exchanger (10) according to either of Claims 14 and 15 is used, the fluid preferably being air.